

Merrill Blueberry Farms, Inc.)	Departmental
Hancock County)	Findings of Fact and Order
Ellsworth, Maine)	Air Emission License
A-836-71-A-N)	

After review of the air emissions license application, staff investigation reports and other documents in the applicant's file in the Bureau of Air Quality, pursuant to 38 M.R.S.A., Section 344 and Section 590, the Department finds the following facts:

I. REGISTRATION

A. Introduction

Merrill Blueberry Farms, Inc. (Merrill) of Ellsworth, Maine has applied for an Air Emission License, permitting the operation of emission sources associated with their blueberry freezing and processing facility.

B. Emission Equipment

Merrill is authorized to operate the following air emission units:

Electrical Generation Equipment

Equipment	Power Output (kW)	Engine Firing Rate (gal/hr)	Maximum Capacity (MMBtu/hr)	Stack #
Generator #1 (existing)	365	26	3.56	1
Generator #2	455	25.7	3.52	2
Generator #3	725	52.5	7.17	3
Generator #4	725	52.5	7.17	4

C. Application Classification

A source is considered a major source based on whether or not expected emissions exceed the "Significant Emission Levels" as given in Maine's Air Regulations. This source is determined to be a minor new source and has been processed as such.

II. BEST PRACTICAL TREATMENT (BPT)

A. Introduction

In order to receive a license the applicant must control emissions from each unit to a level considered by the Department to represent Best Practical Treatment (BPT), as defined in Chapter 100 of the Air Regulations. Separate control requirement categories exist for new and existing equipment as well as for those sources located in designated non-attainment areas.

BPT for new sources and modifications requires a demonstration that emissions are receiving Best Available Control Technology (BACT) as defined in Chapter 100 of the Air Regulations. BACT is a top down approach to selecting air emission controls considering economic, environmental and energy impacts.

BPT for existing emissions equipment means that method which controls or reduces emissions to the lowest possible level considering:

- the existing state of technology;
- the effectiveness of available alternatives for reducing emissions from the source being considered; and
- the economic feasibility for the type of establishment involved.

B. Facility Description

Merrill will operate four Caterpillar diesel-fired electric generators on a permanent basis to supply electric power for running blueberry freezing and processing equipment as well as other ancillary purposes (e.g., basic equipment and lighting). The proposed engine-generator plant would supply all of the facility's electricity on a continuous basis year-round (24/7/365).

Merrill's annual electricity consumption consists of two distinct profiles. For approximately 11 months of the year (all months except August), the facility's power consumption is limited to that required for basic equipment and lighting. The facility's average load over this eleven-month "off-peak" period is approximately 200 kWh. During a four to five week period typically occurring during August, Merrill operates freezing equipment to freeze blueberries that have just been harvested. During this "peak" period, the facility's average load is approximately 850 kWh, with peak loads potentially reaching 1400 kWh (when compressors start up). The number and size of generators selected will provide 100% redundancy for any individual generator. Merrill also proposes to connect all four generators to an automatic switchgear system that will allow the facility to operate in the most fuel-efficient mode possible.

C. NO_x BACT Analysis

Electronic Ignition Engine

Electronic ignition systems adjust the fuel injection timing, air to fuel ratio and other engine parameters based on engine speed, exhaust temperature and other inputs, to minimize emissions.

NO_xTECH

NO_xTECH uses urea or ammonia as the chemical agent to reduce NO_x within a reactor at high temperatures (1,400 to 1,500 °F). Engine exhaust temperatures generally fall within a range of 700 to 1,000 °F, so the NO_xTECH system employs a reactor in which fuel (diesel or natural gas) is burned to raise the exhaust temperature to the required range. Urea or ammonia is injected into the reactor to reduce the NO_x.

The commercial use of NO_xTECH at this time appears to be limited to two installations: Catalina Island Power Generation (a 2.5 MW and a 3.8 MW diesel unit) and Pebbly Beach Station (one 2.8 MW diesel unit). These units are considerably larger than the units proposed by Merrill. Based on the limited experience with this technology, as well as it not being commercially used on engines as small as 0.7 and 0.3 MW, NO_xTECH is not considered BACT.

Selective Catalytic Reduction (SCR)

In an SCR system urea or ammonia is injected into the exhaust gas to react with NO_x in the presence of a catalyst, forming nitrogen and water. Optimum SCR system operation requires the catalyst temperature to remain within 600 to 750 °F for vanadium/titanium based catalysts. Exhaust temperatures higher than this range can cause the oxidation of ammonia and thereby increase NO_x emissions. Operation below the required temperature range reduces the rate of reaction, resulting in uncontrolled NO_x emissions and unreacted ammonia emissions (ammonia slip).

An economic analysis was performed for SCR control on each diesel using the actual tons of NO_x emissions removed during operations:

Emission Unit	Cost per ton of NO _x removed
Generator #1	\$7,900
Generator #2	\$7,200
Generator #3	\$13,300
Generator #4	\$13,300

NO_x BACT Analysis Conclusion

After review of the BACT analysis, it has been determined that BACT for NO_x is the following:

- Use of electronic ignition engines to power Generator #2, #3 and #4;
- Use of an automatic switchgear system that will allow the facility to operate in the most fuel-efficient mode possible; and
- Limit total facility NO_x emissions to no more than 20.0 tons per year.

D. Diesel Generator #1 (existing)

A summary of the BACT analysis for each of the pollutants is discussed below:

1. Emission limits for PM and PM₁₀ are regulated by MEDEP Regulations, Chapter 103.
2. MEDEP Chapter 106 regulates fuel sulfur content, however the use of 0.05% sulfur by weight fuel is more stringent and shall be used.
3. NO_x emission rates are based on “not to exceed” emission data provided by the engine manufacturer.
4. CO and VOC emission rates were based upon AP-42 data dated 10/96 for diesel engines less than 600 hp.
5. The use of an automatic switchgear system to operate the facility in the most fuel-efficient mode possible.
6. Opacity from the diesel engine shall not exceed 20% on a six (6) minute block average basis, except for two (2) six (6) minute block averages in a 3-hour period.

E. Diesel Generator #2

A summary of the BACT analysis for each of the pollutants is discussed below:

1. Emission limits for PM and PM₁₀ are regulated by MEDEP Regulations, Chapter 103.
2. MEDEP Chapter 106 regulates fuel sulfur content, however the use of 0.05% sulfur by weight fuel is more stringent and shall be used.
3. NO_x emission rates are based on “not to exceed” emission data provided by the engine manufacturer.
4. CO and VOC emission rates were based upon AP-42 data dated 10/96 for diesel engines less than 600 hp.
5. The use of an automatic switchgear system to operate the facility in the most fuel-efficient mode possible.
6. The use of an electronic ignition engine to minimize emissions.

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7. Opacity from the diesel engine shall not exceed 20% on a six (6) minute block average basis, except for two (2) six (6) minute block averages in a 3-hour period.

F. Diesel Generator #3 & #4

A summary of the BACT analysis for each of the pollutants is discussed below:

1. Emission limits for PM and PM₁₀ are regulated by MEDEP Regulations, Chapter 103.
2. MEDEP Chapter 106 regulates fuel sulfur content, however the use of 0.05% sulfur by weight fuel is more stringent and shall be used.
3. NO_x emission rates are based on “not to exceed” emission data provided by the engine manufacturer.
4. CO and VOC emission rates were based upon AP-42 data dated 10/96 for diesel engines larger than 600 hp.
5. The use of an automatic switchgear system to operate the facility in the most fuel-efficient mode possible.
6. The use of an electronic ignition engine to minimize emissions.
7. Opacity from each diesel engine shall not exceed 20% on a six (6) minute block average basis, except for two (2) six (6) minute block averages in a 3-hour period.

G. Annual Emission Restrictions

Merrill has the following annual emissions, based on a 12 month rolling total and based on operating records:

Total Annual Emissions for the Facility
(used to calculate the annual license fee)

<u>Pollutant</u>	<u>Tons/yr</u>
PM	1.3
PM ₁₀	1.3
SO ₂	0.5
NO _x	20.0
CO	9.9
VOC	3.7

III. AMBIENT AIR QUALITY ANALYSIS

According to the Maine Regulations Chapter 115, the level of air quality analyses required for a minor new source shall be determined on a case-by-case basis. Based on the information available in the file, and the similarity to existing sources, Maine Ambient Air Quality Standards (MAAQS) will not be violated by this source. Based on the above total facility emissions, Merrill is below the emissions level required for modeling and monitoring.

ORDER

Based on the above Findings and subject to conditions listed below the Department concludes that the emissions from this source:

- will receive Best Practical Treatment,
- will not violate applicable emission standards,
- will not violate applicable ambient air quality standards in conjunction with emissions from other sources.

The Department hereby grants Air Emission License A-836-71-A-N subject to the following conditions:

- (1) Employees and authorized representatives of the Department shall be allowed access to the licensee's premises during business hours, or any time during which any emissions units are in operation, and at such other times as the Department deems necessary for the purpose of performing tests, collecting samples, conducting inspections, or examining and copying records relating to emissions.
- (2) The licensee shall acquire a new or amended air emission license prior to commencing construction of a modification, unless specifically provided for in Chapter 115.
- (3) Approval to construct shall become invalid if the source has not commenced construction within eighteen (18) months after receipt of such approval or if construction is discontinued for a period of eighteen (18) months or more. The Department may extend this time period upon a satisfactory showing that an extension is justified, but may condition such extension upon a review of either the control technology analysis or the ambient air quality standards analysis, or both.

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- (4) The licensee shall establish and maintain a continuing program of best management practices for suppression of fugitive particulate matter during any period of construction, reconstruction, or operation which may result in fugitive dust, and shall submit a description of the program to the Department upon request.
- (5) The licensee shall pay the annual air emission license fee to the Department, calculated pursuant to Title 38 MRSA §353.
- (6) The license does not convey any property rights of any sort, or any exclusive privilege.
- (7) The licensee shall maintain and operate all emission units and air pollution control systems required by the air emission license in a manner consistent with good air pollution control practice for minimizing emissions.
- (8) The licensee shall maintain sufficient records, to accurately document compliance with emission standards and license conditions and shall maintain such records for a minimum of six (6) years. The records shall be submitted to the Department upon written request.
- (9) The licensee shall comply with all terms and conditions of the air emission license. The filing of an appeal by the licensee, the notification of planned changes or anticipated noncompliance by the licensee, or the filing of an application by the licensee for the renewal of a license or amendment shall not stay any condition of the license.
- (10) The licensee may not use as a defense in an enforcement action that the disruption, cessation, or reduction of licensed operations would have been necessary in order to maintain compliance with the conditions of the air emission license.
- (11) In accordance with the Department's air emission compliance test protocol and 40 CFR Part 60 or other method approved or required by the Department, the licensee shall:
 - (i) perform stack testing to demonstrate compliance with the applicable emission standards under circumstances representative of the facility's normal process and operating conditions:
 - a. within sixty (60) calendar days of receipt of a notification to test from the Department or EPA, if visible emissions, equipment operating parameters, staff inspection, air monitoring or other cause indicate to the Department

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- that equipment may be operating out of compliance with emission standards or license conditions; or
- b. pursuant to any other requirement of this license to perform stack testing.
- (ii) install or make provisions to install test ports that meet the criteria of 40 CFR Part 60, Appendix A, and test platforms, if necessary, and other accommodations necessary to allow emission testing; and
- (iii) submit a written report to the Department within thirty (30) days from date of test completion.
- (12) If the results of a stack test performed under circumstances representative of the facility's normal process and operating conditions indicate emissions in excess of the applicable standards, then:
- (i) within thirty (30) days following receipt of such test results, the licensee shall re-test the non-complying emission source under circumstances representative of the facility's normal process and operating conditions and in accordance with the Department's air emission compliance test protocol and 40 CFR Part 60 or other method approved or required by the Department; and
- (ii) the days of violation shall be presumed to include the date of stack test and each and every day of operation thereafter until compliance is demonstrated under normal and representative process and operating conditions, except to the extent that the facility can prove to the satisfaction of the Department that there were intervening days during which no violation occurred or that the violation was not continuing in nature; and
- (iii) the licensee may, upon the approval of the Department following the successful demonstration of compliance at alternative load conditions, operate under such alternative load conditions on an interim basis prior to a demonstration of compliance under normal and representative process and operating conditions.
- (13) Notwithstanding any other provision in the State Implementation Plan approved by the EPA or Section 114(a) of the CAA, any credible evidence may be used for the purpose of establishing whether a person has violated or is in violation of any statute, regulation, or Part 70 license requirement.
- (14) The licensee shall maintain records of malfunctions, failures, downtime, and any other similar change in operation of air pollution control systems or the emissions unit itself that would affect emissions and that is not consistent with the terms and conditions of the air emission license. The licensee shall notify the Department within two (2) days or the next state working day, whichever is later, of such occasions where such changes result in an increase of emissions. The licensee shall report all excess emissions in the units of the applicable emission limitation.

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(15) Upon written request of the Department, the licensee shall establish and maintain such records, make such reports, install, use and maintain such monitoring equipment, sample such emissions (in accordance with such methods, at such locations, at such intervals, and in such manner as the Department shall prescribe), and provide other information as the Department may reasonably require to determine the licensee's compliance status.

(16) Diesel Generator Emission Limits

A. Emissions from Diesel Generator #1 shall not exceed the following:

<u>Pollutant</u>	<u>lb/MMBtu</u>	<u>lb/hr</u>
PM	0.12	0.43
PM ₁₀	n/a	0.43
SO ₂	n/a	0.18
NO _x	n/a	8.79
CO	n/a	3.38
VOC	n/a	1.25

B. Emissions from Diesel Generator #2 shall not exceed the following:

<u>Pollutant</u>	<u>lb/MMBtu</u>	<u>lb/hr</u>
PM	0.12	0.42
PM ₁₀	n/a	0.42
SO ₂	n/a	0.18
NO _x	n/a	6.72
CO	n/a	3.34
VOC	n/a	1.23

C. Emissions from Generator #3 & #4 each shall not exceed the following:

<u>Pollutant</u>	<u>lb/MMBtu</u>	<u>lb/hr</u>
PM	0.12	0.86
PM ₁₀	n/a	0.86
SO ₂	n/a	0.37
NO _x	n/a	16.92
CO	n/a	6.09
VOC	n/a	0.72

- (17) Only diesel fuel having a maximum sulfur content of 0.05% shall be fired in Generators #1, #2, #3 & #4 as well as any rental generating units brought on site. Compliance shall be based on fuel receipts from the supplier showing the percent sulfur of the fuel.
- (18) Visible emissions from each diesel unit, including rental units, shall not exceed 20% opacity on a six (6) minute block average basis, except for two (2) six (6) minute block averages in a 3-hour period.
- (19) Diesel Generator #2, #3 & #4 each shall utilize electronic ignition.
- (20) Diesel Generator #1, #2, #3 and #4 shall use an automatic switchgear system to operate the facility in the most fuel-efficient mode possible.
- (21) The combined actual NO_x emissions from the facility's electrical generation equipment shall not exceed 20 tons on a 12-month rolling total basis, starting with the 12-month period from January 1, 2003 through December 31, 2003, per Condition (24).
- (22) Merrill is authorized to install and operate Generators #1, #2, #3, and #4, as well as rental generators that may be necessary on a temporary basis to meet the facility's electric power needs. NO_x emissions from any rental generators shall be included in the determination of compliance with the 20 TPY limit.
- (23) A license amendment shall not be required for Merrill to retrofit a generator with NO_x emission control equipment if such equipment is necessary to comply with the 20 TPY limit.
- (24) Actual NO_x emissions from Generators #1, #2, #3 and #4 shall be determined on a monthly basis by multiplying each generator's actual fuel consumption during a given month (expressed in gallons) by a NO_x emission factor (expressed in pounds of NO_x per gallon of fuel burned) derived from the most recent emissions test performed on the generator. Emission factors to be used prior to emission tests are as follows:

Generator #1	0.3409 # NO _x /gallon of fuel burned
Generator #2	0.2636 # NO _x / gallon of fuel burned
Generator #3 & #4	0.3257 # NO _x / gallon of fuel burned

- (25) Merrill shall install and operate a fuel flow meter on Generators #1, #2, #3 and #4. Each meter shall be equipped with a totalizer capable of displaying the total number of gallons of fuel burned. The totalizer reading from each generator shall be recorded at the beginning of each calendar month, and the previous month's reading shall be subtracted from the current reading to determine the actual fuel consumption during the prior calendar month.

- (26) The fuel flow meter for Generator #1 shall be installed and operational by **January 1, 2003**. The fuel flow meter for Generator #2, #3 and #4 shall be installed prior to initial startup.
- (27) For purposes of determining fuel consumption in a rental generator, if the rental generator is supplied fuel from its own dedicated storage tank, Merrill shall use records of fuel deliveries along with tank inventory at the beginning and end of its operating period. If the fuel supply for the rental generator is obtained from a storage tank that serves one or more permanent generators, the fuel consumption in the rental generator shall be determined by calculating the combined usage in all generators using fuel deliveries and tank inventory levels during the rental generator's period of operation, and then subtracting out the actual fuel consumption in the permanent generators as determined by totalizer readings.
- (28) The initial NO_x emissions test on generators #1 and #2 shall be performed by **June 30, 2003**. Generators #1 and #2 shall be tested again within twelve months of the date of the initial test.
- (29) The initial NO_x emissions test on generators #3 and #4 shall be performed during the first peak period in which each generator operates.
- (30) Should the combined actual NO_x emissions from all electrical generation equipment be less than 18 tons per year based on the results of the first two emissions tests on generators #1 and #2 and on the results of the initial test on generators #3 and #4, the required frequency of testing shall be limited to every three years. If combined actual emissions are greater than 18 tons per year, each permanently-installed generator shall be tested within twelve months from the previous test. After performing the initial testing for generators #3 and #4, Merrill may limit additional testing to one 725 kW unit and use the resulting emission factor to determine actual emissions from generators #3 and #4.
- (31) To determine the actual monthly NO_x emissions during a month in which a NO_x emission test is performed, Merrill shall use the results of the most recent emission test performed for a given generator to calculate its total NO_x emissions for the month in which the test was performed and for each subsequent month until the next NO_x emission test is performed.
- (32) In determining actual NO_x emissions from a rental generator, Merrill is authorized to use either an emission factor (expressed in pounds of NO_x per gallon of fuel burned) derived from the manufacturer's guaranteed emission rate at a representative operating load, or the results of NO_x emission testing performed on the unit itself.
- (33) Merrill shall pay the annual air emission license fee within 30 days of **September 30th** of each year. Pursuant to 38 MRSA §353-A, failure to pay this annual fee in the stated timeframe is sufficient grounds for revocation of the license under 38 MRSA §341-D, subsection 3.

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(34) The term of this order shall be for five (5) years from the signature date below.

DONE AND DATED IN AUGUSTA, MAINE THIS DAY OF 2002.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: _____
 MARTHA G. KIRKPATRICK, COMMISSIONER

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: July 29, 2002
Date of application acceptance: August 9, 2002

Date filed with Board of Environmental Protection: _____

This order prepared by Mark. E. Roberts, Bureau of Air Quality